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A framework for real-time dynamic rescuing system for indoor environment (Article)

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Abstract

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Most current emergency operations employ manual find-and-rescue procedures. Consequently, people trapped in a building remain helpless in an emergency, unable to call out successfully until a rescue team come along which often may be too late. The work presented in this study proposes a dynamic real time rescue system approach to an emergency such as fire outbreak in residential multilevel building or apartment. The research focuses indoor environment , even though the idea is adaptable for outdoor environment as well. The study proposes utilizing automated reporting of disaster situation to fire service in the event of a fire outbreak, automated residents' roll calls to all registered occupants in a building, automated emergency status request push notification to all residents, and dynamic rescue combined with indoor pathway safest route guidance, to guarantee safer rescuing procedures. The dynamic rescue approach employs dynamic trapped resident information mining to deploy firemen proportionately to affected areas. The accuracy of the resident information mining is approximately 97.8 % for large datasets while 90% (9/10) for small datasets. The study proposes strategies to mitigate observed challenges with most of the previous rescuing systems. It is hoped that this study may provide a new direction for emerging smart buildings and future directions for rescuing and emergency situation.

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